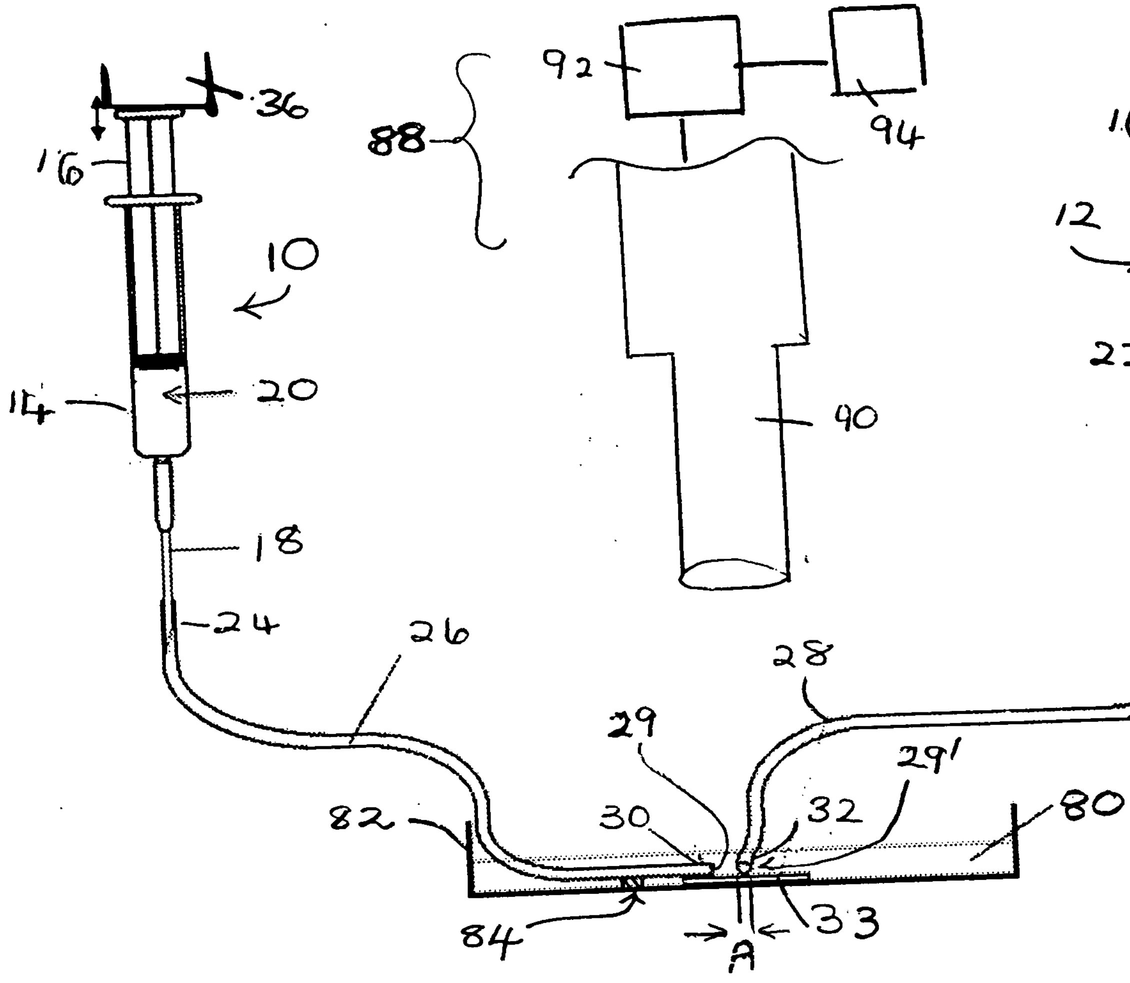
A

FIG.1

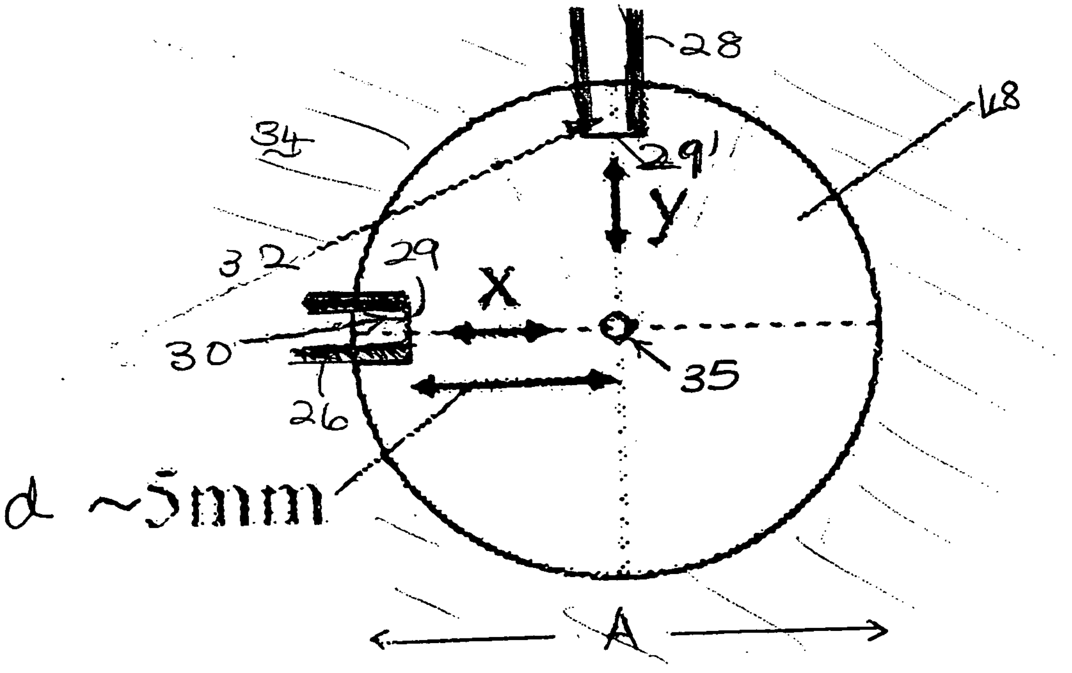
y
X
d ~5mm
A

FIG.2

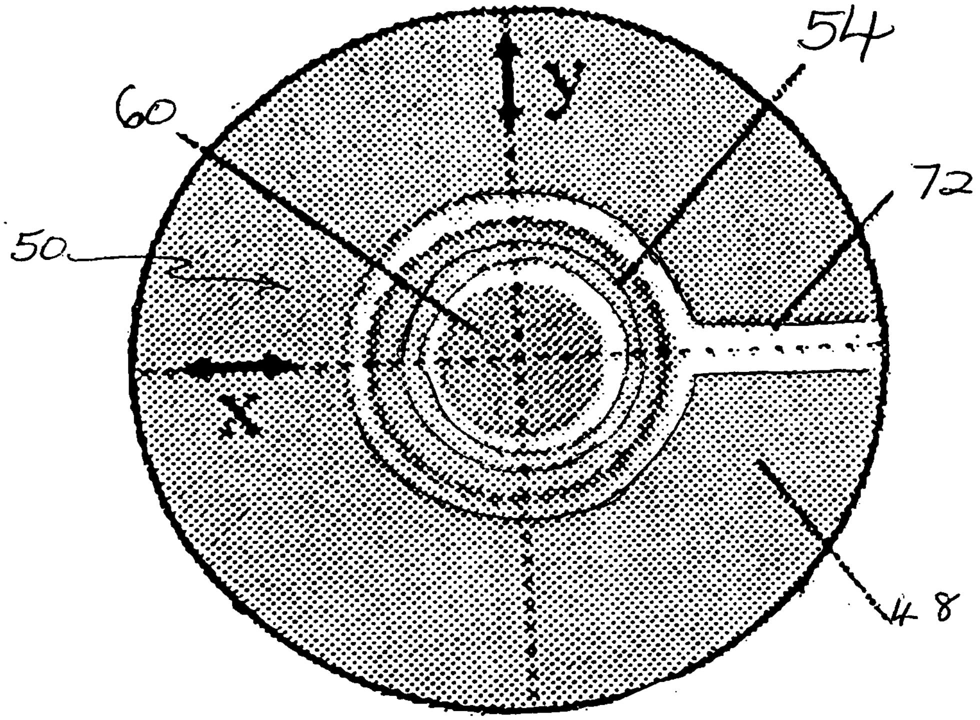

Figure 3

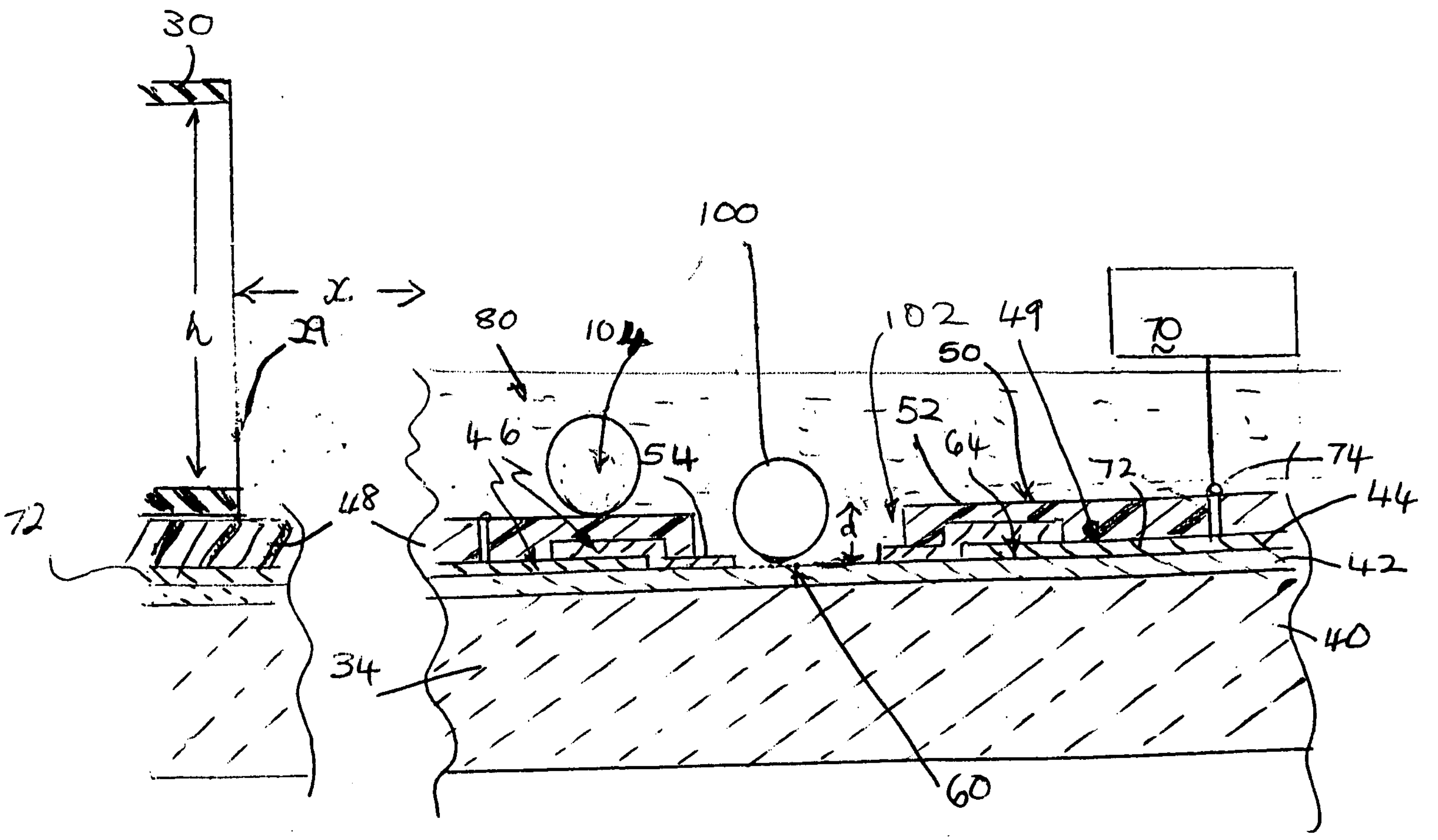
h
x
d

FIG 4

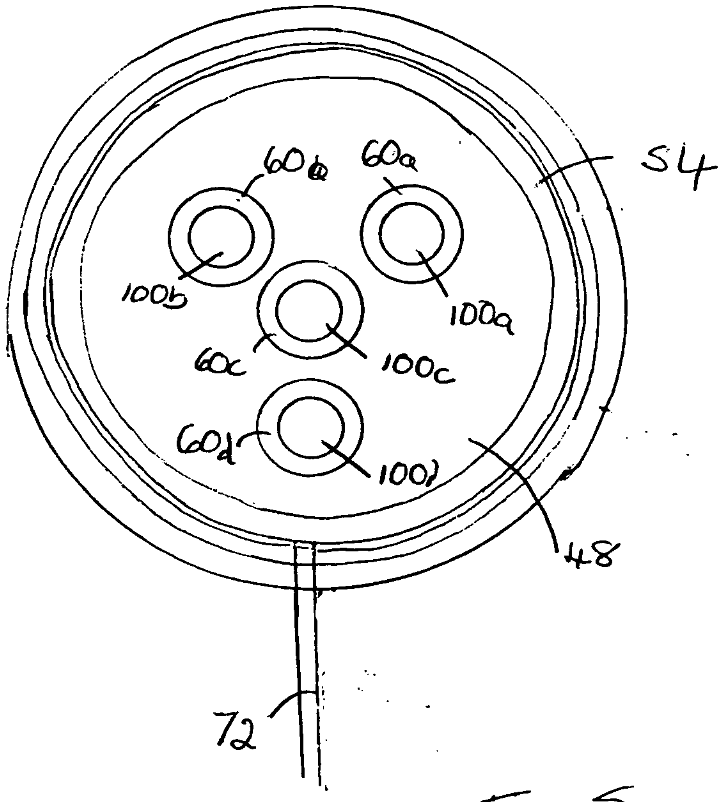

Fig 5

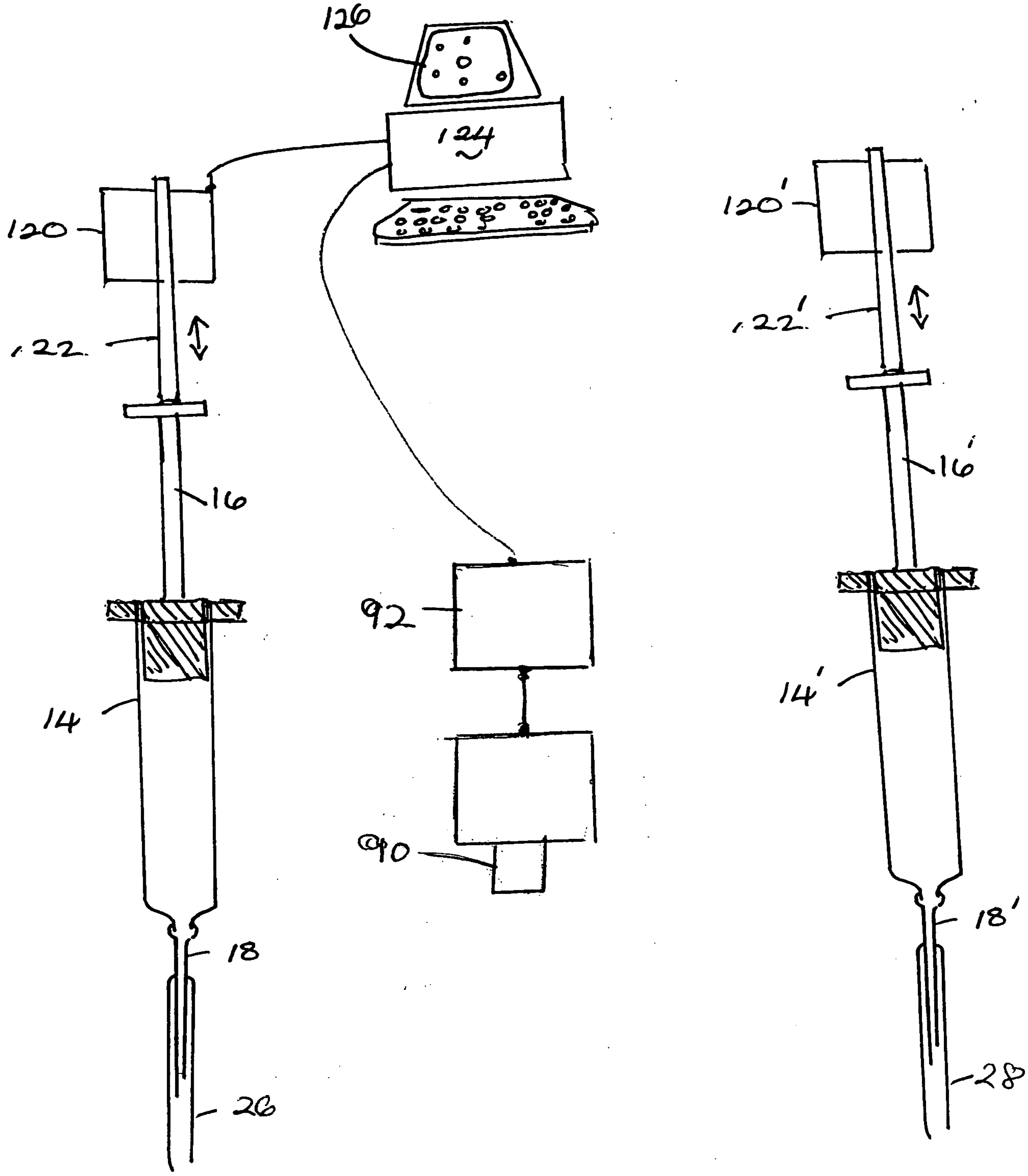

FIGURE 6

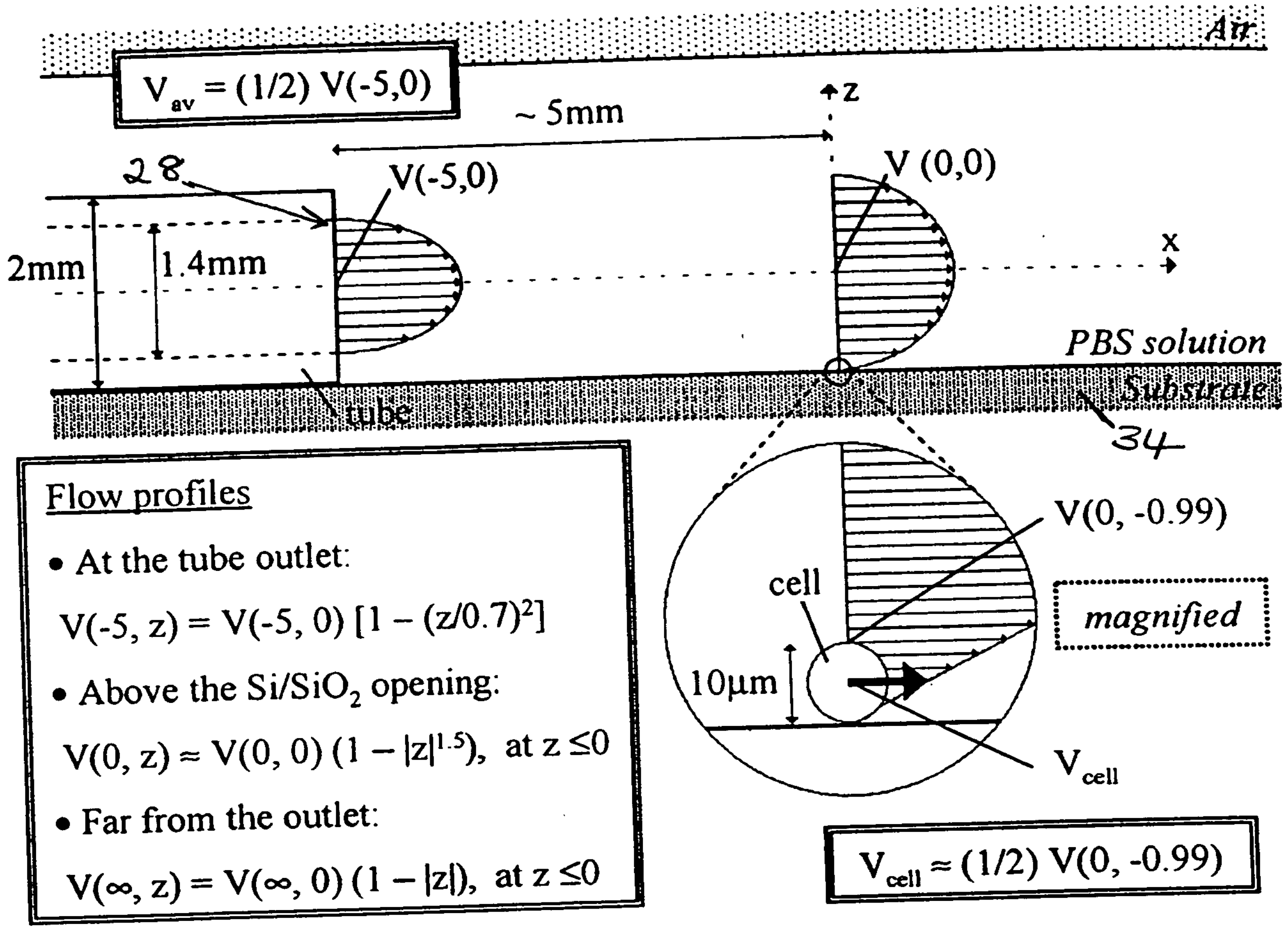
Air
$V_{av} = (1/2)\,V(-5,0)$
~ 5mm
z
28
V(-5,0)
V (0,0)
2mm
1.4mm
x
PBS solution
tube
Substrate
34
Flow profiles
• At the tube outlet:
$V(-5, z) = V(-5, 0)\,[1 - (z/0.7)^2]$
• Above the Si/SiO$_2$ opening:
$V(0, z) \approx V(0, 0)\,(1 - |z|^{1.5})$, at $z \leq 0$
• Far from the outlet:
$V(\infty, z) = V(\infty, 0)\,(1 - |z|)$, at $z \leq 0$
V(0, -0.99)
cell
magnified
10μm
V_{cell}
$V_{cell} \approx (1/2)\,V(0, -0.99)$

Figure 7

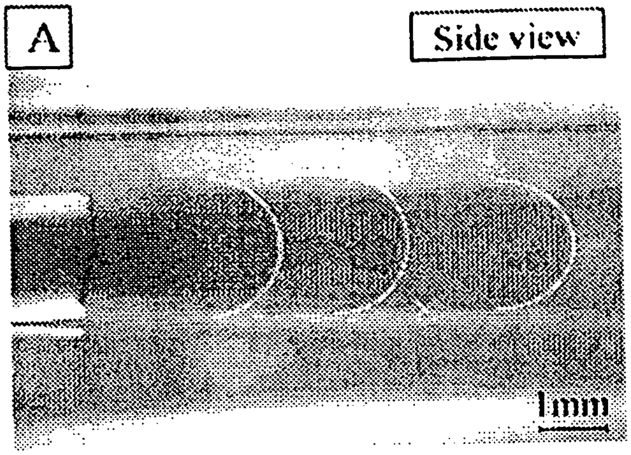

FIGURE 8A

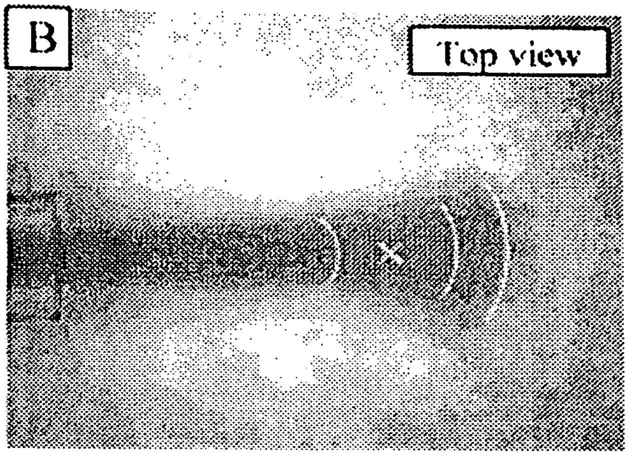

FIGURE 8B

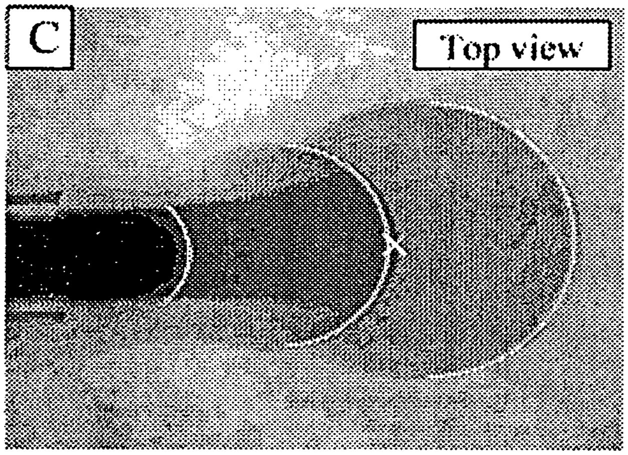

FIGURE 8C

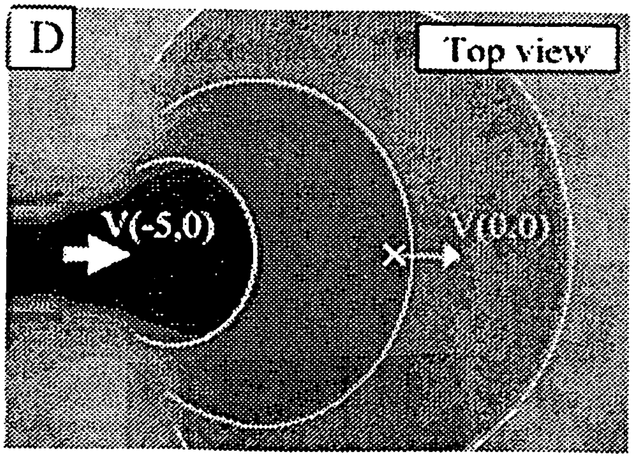

FIGURE 8D

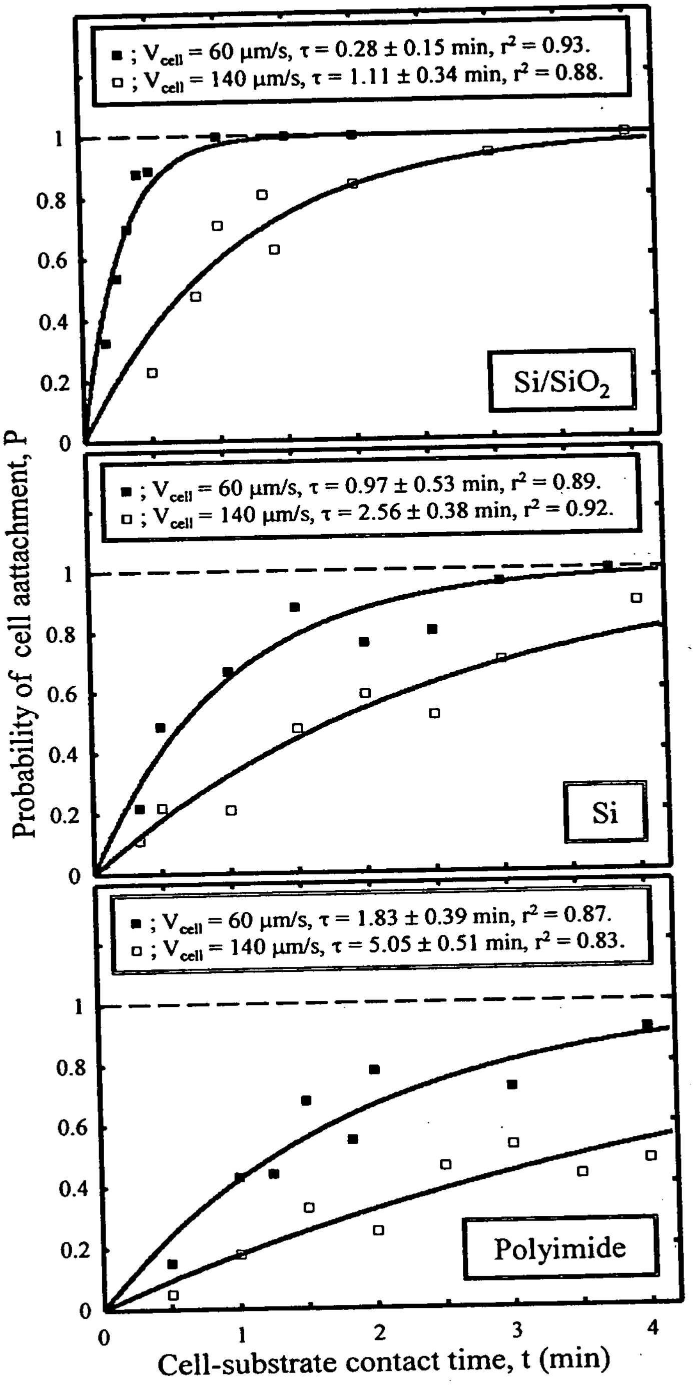

Figure 9a

Figure 9b

Figure 9c

Figure 9

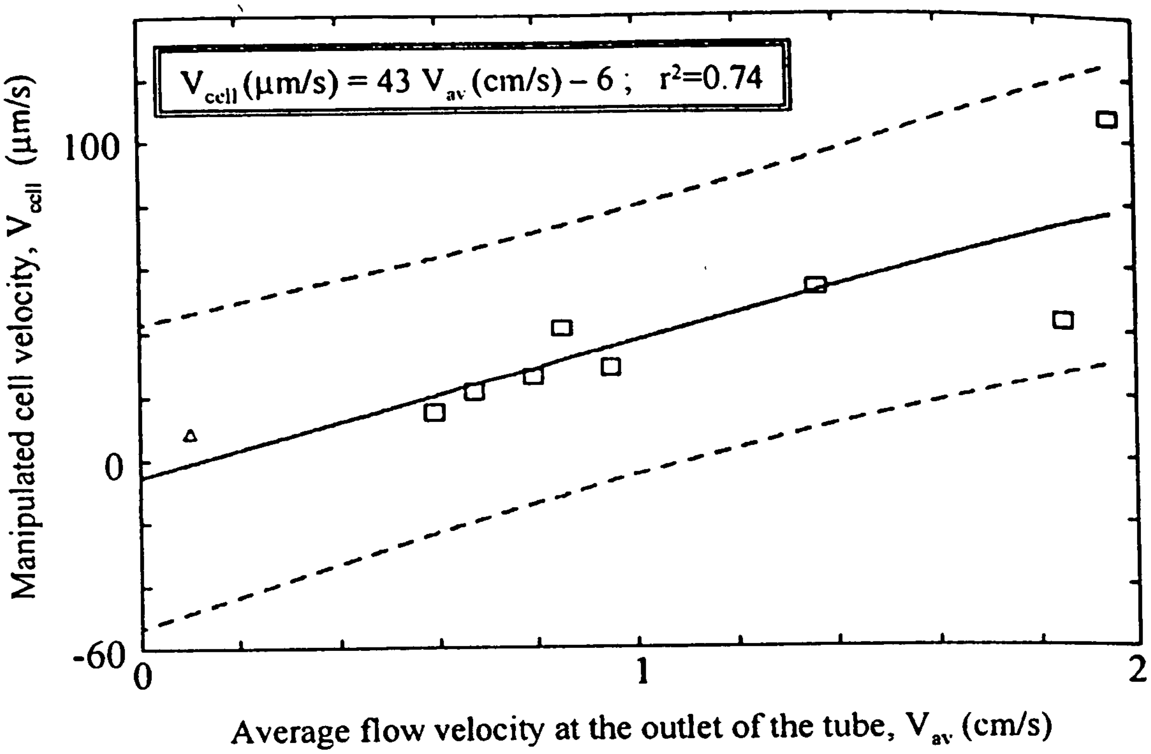
V_{cell} (µm/s) = 43 V_{av} (cm/s) – 6 ; r^2=0.74
Manipulated cell velocity, V_{cell} (µm/s)
100
0
-60
0
1
2
Average flow velocity at the outlet of the tube, V_{av} (cm/s)

Figure 10

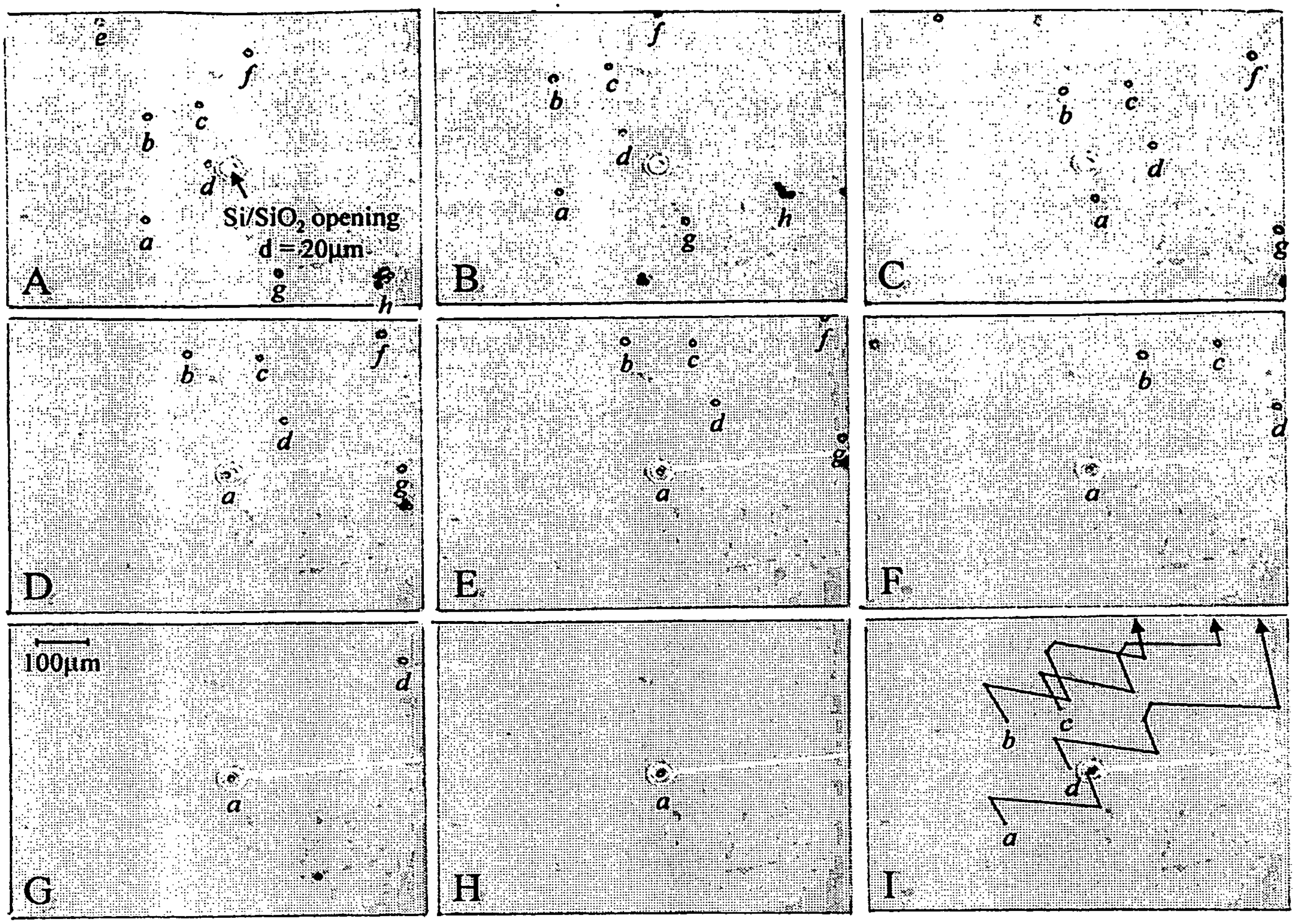
e
f
c
b
d
Si/SiO$_2$ opening
d = 20µm
a
A
g
h
f
c
b
d
h
a
g
B
f
c
b
d
a
g
C
f
b
c
d
a
g
D
f
b
c
d
g
a
E
b
c
d
a
F
100µm
d
a
G
a
H
b
c
d
a
I

FIGURE 11

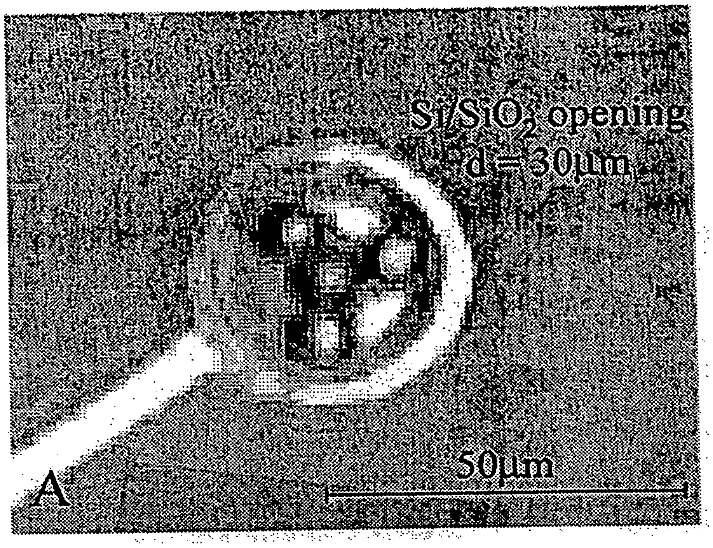

Figure 12a

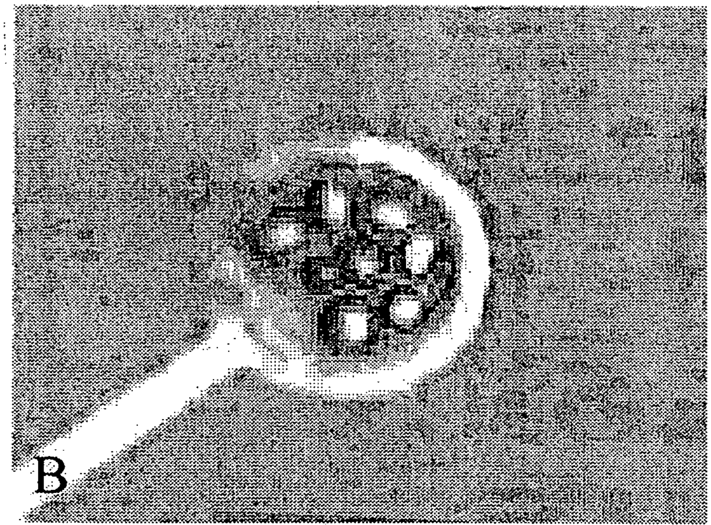

Figure 12b